Report Date: 16 May 2014

Summary Report for Individual Task
011-218-1325
Perform Emergency Procedures for Engine Failure During Take-Off
Status: Approved

Condition: In a C-12 series airplane, with an IP, VMC.

Standard: 1. Maintain positive aircraft control.

2. Confirm the failed engines propeller feathered.

3. Maintain up to a 5-degree bank angle into operating engine (ball one-half off center).

4. Obtain and maintain the appropriate airspeed for the segment being flown (takeoff safety speed [V_2 or V_{YSE}] +5, -0 KIAS).

5. Complete and verify the procedure with the CL above 400 feet AGL.

Special Condition: NIGHT CONSIDERATIONS: Monitor heading and altitude instruments closely and be prepared to convert to instrument flight if the visual horizon is lost or if experiencing vertigo.

Safety Risk: Medium

MOPP 4:

Task Statements

Cue: None

DANGER

None

WARNING

None

CAUTION

None

Remarks: None

Notes: None

WARNING

Simulating an engine failure by retarding a power lever to idle during the takeoff run below VMCA will result in loss of directional control. (See Task 1352.)

WARNING: V1 engine cuts will not be performed in the C-12 aircraft and simulated engine failures will not be initiated below VSSE.

1. Crew actions.

Note:
Underlined emergency items in the operator's manual will be committed to memory. This should not be construed to mean the P* must verbally call out the underlined items in the procedure while dealing with an emergency. The underlined items are DO items followed by verification with the CL, when time and altitude permits.

a. The crew will discuss rejected takeoff criteria, emergency return plan, and crew responsibilities during the departure brief.

b. The crew will review the TOLD card and determine the course of action if an engine fails at or after lift-off.

c. The P*'s main focus will be to fly the aircraft.

d. The IP should not simulate an inoperative autofeather until a safe altitude is reached. The IP will complete the required procedures pertaining to the P's crew duties. The IP will also read the CL and perform all designated P actions and those crew callouts and duties, IAW chapter 6, requested by the P*.

2. Procedure. The P*, assisted by the P, will perform a normal takeoff using standard callouts until the single engine is initiated then the crew will perform the actions described below:

a. Discussion. The course of action for an engine failure on takeoff depends on where the failure occurs during the takeoff flight path and the airspeed at which it occurs. Additionally, TEMP, PA and WT will affect the aircraft's ability to climb and accelerate. The most critical point to lose an engine is at V1. This is a decision point for the crew. Does the crew abort the takeoff and stop or continue the takeoff? One of the criteria to continue the takeoff has been met by reaching V1. However that by itself does NOT guarantee the aircraft will safely fly when rotated. TOLD card planning will tell the crew the capabilities based on departure WT, TEMP and PA.

Note:
If an engine fails at or immediately after liftoff, climb to 35 feet may be critical. Positive pilot actions will be required to maintain aircraft control. The distance required to attain 35 feet AGL will be significant.

Note. Takeoff power is already applied and the P is responsible for maintaining the power at the appropriate setting.

b. Engine failure immediately after lift-off–flight continued.

(1) (1) The P* will—

(a) Maintain directional control with the rudder and simultaneously establish up to 5-degree bank angle into the operating engine (ball one-half off center) while adjusting pitch to obtain V2, make pitch adjustment smoothly to avoid a TQ roll.

(b) At the "POSITIVE RATE" callout, retract the gear (left seat crewmember).

(c) Climb at V2 for the aircraft configuration.

(d) Identify the failed engine and verify with the P. "CONFIRM NUMBER ONE (OR TWO) ENGINE HAS FAILED."

(e) Confirm with the P that the propeller did or did not feather, “DID THE PROPELLER FEATHER?” All C-12 series aircraft have an autofeather system installed it should feather the propeller. If an actual engine fails, the autofeather should feather the propeller in less than 10 seconds. Visual identification is easy if one propeller is stationary.

(f) If the aircraft is being flown with an inoperative autofeather, direct the P to manually feather the propeller after mutual identification and verification that the propeller did not feather by directing the P to “IDENTIFY THE NO.1 (or No.2 as appropriate) PROP LEVER.” The P will place the index finger on the appropriate prop lever. The P* visually confirms the correct propeller lever has been identified, state: “CONFIRMED, FEATHER THE PROP” or NEGATIVE, RE-IDENTIFY THE NO. __ PROP.”

(g) When sufficient altitude that is clear of all obstacles can be obtained and the rate of climb allows, accelerate to VYSE. It may be necessary to climb to single-engine maneuvering altitude (400 feet AGL) or to an altitude that will guarantee obstacle clearance and then level the aircraft to accelerate to VYSE.

(h) Direct “FLAPS UP” at VYSE (if flaps were used on takeoff).

(i) Transfer power control back from the P by stating “MY POWER" or P stating “YOUR POWER” at 400 feet AGL. Reduce power to MAX CONT.

(j) Call for the “ENGINE MALFUNCTION AFTER V1 CHECKLIST” when time, altitude, and workload permits.

(k) Land at the nearest suitable airport.

(2) The P will—

(a) Set and maintain takeoff power from the beginning of the takeoff roll until the P* “MY POWER” callout is directed-normally at 400 feet AGL.

(b) Call “POSITIVE RATE” when two climb indications are observed.

(c) Confirm for the P*, “I CONFIRM NO. __ HAS FAILED or NEGATIVE, THE __ (opposite) ENGINE HAS FAILED.” In addition state: “YES, THE NO.1/NO.2 PROPELLER HAS FEATHERED’ or NO, IT DID NOT FEATHER.”

(d) Manually feather the failed engine’s propeller when the P* confirms the correct propeller lever has been identified and state, “PROP FEATHERED.”

(e) State “V2 IS __” (for the flap setting).

(f) Retract the flaps at VYSE (if flaps were used on takeoff) when directed by the P* and state, “FLAPS UP” when the flap handle is moved to the up position and position is verified.

(g) Transfer power control to P* by stating “YOUR POWER” at 400 feet AGL.

(h) Read the CL when asked by the P*.

(i) Inform ATC of the emergency and intentions.

c. Engine failure after VYSE. Any additional airspeed above VYSE at the time of the engine failure will result in increased control effectiveness and fewer controllability problems. Additionally, the extra airspeed inertia will allow the aircraft to continue to climb at fairly positive rate while it decelerates. The flying procedure is essentially the same. Takeoff power is already applied, the gear is retracted and airspeed is at or beyond VYSE. The critical crew actions remaining are to verify the propeller feathered and maintain directional control with the rudder and simultaneously establish up to 5-degree bank angle into the operating engine (ball one-half off center). Complete the applicable duties remaining.

Note:
To simulate engine failure with an armed autofeather, the IP will retard the affected power lever to IDLE while simultaneously moving the propeller lever to the feather detent position. The IP will advance the power lever to establish zero thrust as soon as practical (8 to 12 percent TQ or 120 feet/pounds).

Note. For training in the airplane, the V2 net climb gradient should be at least 2.0 percent.

Note. During single-engine climb, additional power will be available by retracting the ice vanes, if extended. Environmental consideration should be given prior to retraction.

(Asterisks indicates a leader performance step.)

Evaluation Guidance:
Engine failure airborne after obtaining VSSE, task may be trained and evaluated in the aircraft or in an approved FS.

Evaluation Preparation:
At V1 or after lift-off below VSSE flight continued, task must be trained and evaluated only in an approved FS.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Maintained positive aircraft control.			
2. Confirmed the failed engine's propeller feathered.			
3. Maintained up to a 5-degree bank angle into operating engine (ball one-half off center).			
4. Obtained and maintained the appropriate airspeed for the segment being flown (takeoff safety speed [V2 or VYSE] +5, -0 KIAS).			
5. Completed and verifed the procedure with the CL above 400 feet AGL.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	TM 1-1510-218-10	OPERATORS MANUAL FOR ARMY C-12C, C-12D, C-12T1, AND C-12C2 AIRCRAFT	No	No
	TM 1-1510-218-CL	OPERATORS AND CREWMEMBERS CHECKLIST FOR ARMY C-12C AIRCRAFT (NSN 1510- 01-070-3661);ARMY C-12D AIRCRAFT (1510-01-087-9129);ARMY C-12T AIRCRAFT (1510-01-470-0220)	No	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks : None